Suez, from the Sea.

STEAM COMMUNICATION WITH INDIA.

When two places become connected by a railway, the change effected in their means of communication is striking in proportion to their distance from each other. London Bridge and Greenwich are some twenty minutes nearer to one another than they were before a railway linked them more closely; but the journey from London to Lancaster or Darlington is shortened by fourteen or fifteen hours, even on a comparison with the quick travelling of the mail-coaches, which were superseded by the railways when everything connected with them was carried to the utmost perfection. The improvements effected within the last seven years in the means of communication between England and India are far more extraordinary than any of the changes wrought by the railways in this country. Sixty years ago the voyage from London to Calcutta usually occupied five and six months, and to China seven months, and the "course of post" with India was calculated at little less than twelve months. Intelligence from this distant quarter arrived only at uncertain intervals, and often through indirect channels. A Dutch or Danish East Indiaman left despatches for England at Lisbon, or Falmouth, or wherever it was most convenient to touch. The French received despatches from their establishments in India; and reports, originating in France, were often in circulation in London, which neither the East India Company, the government, nor any one could affirm or contradict, though they might relate to matters of the highest import and which called immediately for active measures. Occasionally despatches were received overland both in England and France, and by the Asiatic Company at Trieste; but these opportunities of communication were only available to the parties who received them, and led to vague rumours, or such reports as it happened to be for the interest of each to put into circulation. Overland despatches reached London in rather more than three months through Persia and Turkey, *viâ* Constantinople. Thirty or forty years ago, by improvements in nautical science, the voyage between England and India was reduced to about four months and a half; and within the last ten or fifteen years, further improvements of this nature, and a more accurate knowledge of the currents and winds experienced in the course traversed, reduced the average duration of the voyage to about three months and a half. A few voyages have been made in three months; but, taking the average, the saving effected was at least two months, the total saving in the "course of post" being nearly five months. Within the last half-dozen years the means of communication with India have been still further quickened, as we shall presently show.

Until 1836 the intercourse between Europe and India was carried on by the Cape of Good Hope. The distance of Calcutta from London by this route is above sixteen thousand miles; and it is something like going from London to Herne Bay by Tunbridge, Dover and Ramsgate, the distance to India by the Red Sea being one-half shorter. This advantageous line of communication was not opened until after several years' active exertions both in England and India. In 1830 the Hugh Lindsay, a steamer of four hundred tons, with two engines each of eighty horse-power, made the first experimental voyage from Bombay to Suez at the expense of the Indian government. Depôts of coal were previously formed at Aden, Judda, Cosseir, and Suez. The steamer left Bombay on the 20th of March, and arrived at Suez on the 22nd of April. The mail consisted of three hundred and six letters, which might have reached England in sixty-one days from Bombay, if any arrangements had been made for forwarding them. The second voyage from Bombay to Suez was completed between the 5th and 27th of December in the same year. The third voyage was made in January, 1832, and though very unfavourable weather was experienced, the passage was completed in twenty-nine days and sixteen hours, the time actually occupied in steaming being twenty-one days and six hours. Seven hundred letters were in the mail-bags, and, but for the reason abovementioned, they could have been received in England in fifty-eight days. The Hugh Lindsay made a fourth experimental voyage in January, 1833, which was completed in thirty-three days, allowing above ten days for stoppages. In July, 1834, a select committee of the House of Commons on the subject of steam-navigation with India recommended the line by the

Red Sea, and a grant of twenty thousand pounds for the survey of the Euphrates; but this river was found to be impracticable, and the route by the Red Sea alone fixed the public attention. By this time its practicability for steam-navigation had been ascertained during the north-east monsoons, but not in those from the south-west. The latter, however, only prevail four months in the year, from June to September inclusive. Only a quarterly communication was thought of at this period, either by Lord William Bentinck, then Governor-General of India, or Mr. Waghorn, whose services in improving the means of intercourse with India can scarcely be too highly praised.

In 1835 the line of communication by the Post-office steamers in the Mediterranean was extended to Alexandria, and this encouraged the exertions making in India to establish a regular communication by steamers between Bombay and Suez. Letters could now be transmitted from London to Alexandria, to the care of the British Consul, who despatched them whenever an opportunity presented itself, though they were often delayed several months. Only one-half of the line to India was yet opened. Mr. Waghorn proceeded to Egypt about this time, to remedy the defect in the transmission of Indian letters to and from Alexandria. He appointed an agency in London, where letters intended to be confided to him were registered and marked before being put into the Post-office. On the mails reaching Alexandria, these letters were forwarded immediately to Suez, and if no vessels were on the point of sailing, they were sent onward by janissaries or by the country boats to Mocha or Aden, where the opportunities of transmitting them to India were much more frequent. The letters which were not sent through Mr. Waghorn's agency, laid quietly at the British Consul's until they could be despatched direct from Suez. At this period, there was, strictly speaking, no regular conveyance between England and India. Ship-letter bags were made up at the Post-office in the same way as they now are for the Australian colonies, but no one on putting a letter into the Post-office of a country town knew when it would leave England, and those who had frequent occasion to write to friends in India often found it advantageous to transmit their letters to some agent in London, who knew what ships were likely to make the quickest passage, or to stop at the fewest intermediate points; and could send expresses to ships for India lying wind-bound in the Channel, while letters sent through the Post-office remained there until another ship sailed. In 1836, the Hugh Lindsay again left Bombay for Suez, with letters and passengers, and in consequence of the arrangements of Mr. Waghorn, and the extension of the packet service to Alexandria, the mail reached England in fifty days; but it was hoped that by various improvements the time might at a future period be reduced to about forty days. More than a year elapsed before the line of steamers between Suez and Bombay was completely established; but in this interval Mr. Waghorn accelerated the rate of communication by conveying the Indian letters through France, instead of sending them to Falmouth by the Mediterranean steamers, which stopped at Gibraltar and Lisbon. In 1839 the English Government concluded a convention with that of France, for the transmission of the India mails through Paris to Marseille.

The mails from India are now despatched from Bombay on the first day in every month, after the arrival of the steamer from Ceylon, and the inland post with the correspondence from Madras and Calcutta. About the 20th of the month the steamer lands the mails at Suez, and by the 22nd they are put on board the Mediterranean steamer at Alexandria, which reaches Malta on the 24th, and Marseille on the 30th. Its arrival is announced in Paris by telegraph on the same day, a distance of nearly five hundred miles, and the most important items of news are communicated by the same means. Early in the afternoon the intelligence is published by the ministerial evening journal, a copy of which is forwarded by an extraordinary express to London, where the news is re-published about twenty-four hours afterwards. It is however sometimes the practice of the French government not to announce the telegraphic news until the day after it is received, or later; but occasionally the arrival of the mail at Marseille, and the intelligence which it brings, is officially made known by an official placard at the Bourse. The exertions of the London newspapers do not end with the despatch of the express from Paris, which perhaps may just simply announce the arrival of the mail. As soon as possible special couriers (for on several occasions more than one has been despatched) start for London with packets for the principal morning papers. The distance is about seven hundred and forty miles, namely, from Marseille to Paris, four hundred and ninety-seven; Paris to Calais, one hundred and fifty; Calais to Dover, twenty-one; and Dover to London, seventy-two. The expense of each express is above 100*l*., and on the fourth day after the mail has reached Marseille the intelligence from India, China, and the East generally is published in London. The opening of the South-Eastern Railway will frequently have the effect of bringing the publication of this information within the usual hours of business at the great marts for East India and China produce. Railroads through France would shorten the route by a couple of days. The Post-office authorities in France have on several occasions interfered most vexatiously with the couriers conveying these despatches for the London journals, and they have several times been seized, on the pretence that they were not authorised to carry letters. In March last, one of these couriers was prosecuted by the Post-office and sentenced to pay certain fines. It was frivolously contended that they might convey the despatches in post-chaises, but not on horseback. The London journalists represented their case to the French Minister, through our ambassador at Paris, but it does not appear that they have obtained any security against future interruptions. On the day following the arrival of the newspaper expresses, the mails with the letters and newspapers are received at the Post-office. A week elapses, and the letters arrive which pay a lower rate of postage, and are not sent through France, but brought to Falmouth by the Mediterranean steamer.

[To be continued.]

CARDINAL WOLSEY AFTER HIS FALL.

MEMOIRS ON ENGLISH HISTORY.

AMONGST the earliest, and certainly far exceeding most memoirs in interest and importance, is 'The Life of Wolsey, by George Cavendish, his Gentleman Usher.' It was long a question who wrote this remarkable book; but the doubt was satisfactorily cleared up by Mr. Hunter, who found that it was written by the brother of Sir William Cavendish, a faithful follower of the great Cardinal. There are ten MSS. in existance of this ancient work; but it has been very carefully edited by Mr. Singer. We confine our extracts to those more striking passages which relate to the great Cardinal after his fall from power.

The courtiers of Henry VIII. had procured the Cardinal's dismissal to the archbishopric of York. Wolsey commenced his journey in the beginning of

the Passion Week of the year 1530. He travelled on horseback with his attendants, performing the offices of the church at Peterborough, and at other places on his road. He halted at length at Southwell, near Newark, where there was a palace belonging to his archbishopric. "He was fain, for lack of reparation of the bishop's place which appertained to the see of York, to be lodged in a prebendary's house against the said place, and there kept house until Whitsuntide next, against which time he removed into the place, newly amended and repaired, and there continued the most part of the summer, surely not without great resort of the most worshipfullest gentlemen of the country, and divers other, of whom they were most gladly entertained, and had of him the best cheer he could devise for them, whose gentle and familiar behaviour with them caused him to be greatly beloved and esteemed through the whole country. He kept a noble house, and plenty of both meat and drink for all comers, both for rich and poor, and much alms given at his gates. He used much charity and pity among his poor tenants and other; although the fame thereof was no pleasant sound in the ears of his enemies, and of such as bare him no good will, howbeit the common people will report as they find cause; for he was much more familiar among all persons than he was accustomed, and most gladdest when he had an occasion to do them good. He made many agreements and concords between gentleman and gentleman, and between some gentlemen and their wives that had been long asunder, and in great trouble, and divers other agreements between other persons; making great assemblies for the same purpose, and feasting of them, not sparing for any costs, where he might make a peace and amity, which purchased him much love and friendship in the country." After remaining for some time at Southwell, the Cardinal removed to Scrooby, another house belonging to the bishopric of York; "which was lamentable to all his neighbours about Southwell, and as it was lamentable unto them, so was it as much joy to his neighbours about Scrooby. Against the day of his removing, divers knights and other gentlemen of worship in the country came to him to Southwell, intending to accompany and attend upon him in that journey the next day, and to conduct him through the forest unto Scrooby. But he being of their purpose advertized, how they did intend to have lodged a great stag or twain for him by the way, purposely to show him all the pleasure and disport they could devise, and having, as I said, thereof intelligence, was very loth to receive any such honour and disport at their hands, not knowing how the king would take it; and being well assured that his enemies would rejoice much to understand that he would take upon him such presumption, whereby they might find an occasion to inform the king how sumptuous and pleasant he was, notwithstanding his adversity and overthrow, and so to bring the king into a wrong opinion of him, and cause small hope of reconcilement, but rather that he sought a mean to obtain the favour of the country to withstand the king's proceedings, with divers such imaginations, wherein he might rather sooner catch displeasure than favour and honour. And also, he was loth to make the worshipful gentlemen privy to this his imagination, lest peradventure they should conceive some toy or fantasy in their heads by means thereof, and so to eschew their accustomed access, and absent themselves from him, which would be as much to his grief as the other was to his comfort. Therefore he devised this mean way, as hereafter followeth, which should rather be taken for a laughing disport than otherwise: first, he called me unto him secretly at night, going to his rest, and commanded me in anywise most secretly that night to cause six or seven horses, besides his mule for his own person, to be made ready by the break of day for him and such persons as he appointed to ride with him to an abbey called Welbeck, where he intended to lodge by the way to Scrooby, willing me to be also in readiness to ride with him, and to call him so early that he might be on horseback, after he had heard mass, by the breaking of the day. Sir, what will you more? All things being accomplished according to his commandment, and the same finished and done, he, with a small number before appointed, mounted upon his mule, setting forth by the breaking of the day towards Welbeck, which is about sixteen miles from thence; whither my lord and we came before six of the clock in the morning, and so went straight to his bed, leaving all the gentlemen strangers in their beds at Southwell, nothing privy of my lord's secret departure, who expected his uprising until it was eight of the clock. But after it was known to them and to all the rest there remaining behind him, then every man went to horseback, galloping after, supposing to overtake him. But he was at his rest in Welbeck or ever they rose out of their beds in Southwell, and so their chief hunting and coursing of the great stag was disappointed and dashed. But at their thither resort to my lord, sitting at dinner, the matter was jested, and laughed out merrily, and all the matter well taken.

"My lord the next day removed from thence, to whom resorted divers gentlemen of my lord the Earl of Shrewsbury's servants, to desire my lord, in their master's name, to hunt in a park of the earl's, called Worksop Park, the which was within a mile of Welbeck, and the very best and next way for my lord to travel through on his journey, where much plenty of game was laid in a readiness to show him pleasure. Howbeit he thanked my lord their master for his gentleness, and them for their pains; saying that he was no meet man for any such pastime, being a man otherwise disposed; such pastimes and pleasures were meet for such noblemen as delight therein. Nevertheless he could do no less than to account my Lord of Shrewsbury to be much his friend, in whom he found such gentleness and nobleness in his honourable offer, to whom he rendered his lowly thanks. But in no wise they could entreat him to hunt. Although the worshipful gentlemen being in his company provoked him all that they could do thereto, yet he would not consent, desiring them to be contented, saying, that he came not into the country to frequent or follow any such pleasures or pastimes, but only to attend to a greater care that he had in hand, which was his duty, study, and pleasure. And with such reasons and persuasions he pacified them for that time. Howbeit yet as he rode through the park, both my Lord of Shrewsbury's servants, and also the foresaid gentlemen, moved him once again, before whom the deer lay very fair for all pleasant hunting and coursing. But it would not be; but he made as much speed to ride through the park as he could. And at the issue out of the park he called the earl's gentlemen and the keepers unto him, desiring them to have him commended to my lord their master, thanking him for his most honourable offer and good will, trusting shortly to visit him at his own house; and gave the keepers forty shillings for their pains and diligence, who conducted him through the park. And the next day he came to Scrooby, where he continued until after Michaelmas, ministering many deeds of charity. Most commonly every Sunday (if the weather did serve) he would travel unto some parish church thereabout, and there would say his divine service, and either hear or say mass himself, causing some one of his chaplains to preach unto the people. And that done, he would dine in some honest house of that town,

where should be distributed to the poor a great alms, as well of meat and drink, as of money to supply the want of sufficient meat, if the number of the poor did so exceed of necessity. And thus with other good deeds practising and exercising during his abode there at Scrooby, as making of love-days and agreements between party and party being then at variance, he daily frequented himself there about such business and deeds of honest charity." On his journey from Scrooby to Cawood Castle, which is about seven miles from York, the Cardinal confirmed many hundred children and performed various acts of charity. On his arrival at Cawood, "he had intelligence by the gentlemen of the country, that used to repair unto him, that there was sprung up a great variance and deadly hate between Sir Richard Tempest and Mr. Brian Hastings, then being but a squire, but after made knight, between whom was like to ensue great murder, unless some good mean might be found to redress the inconvenience that was most likeliest to ensue. My lord being thereof advertised, lamenting the case, made such means by his wisdom and letters, with other persuasions, that these two gentlemen were content to resort to my lord to Cawood, and there to abide his order, high and low. Then there was a day appointed of their assembling before my lord, at which day they came, not without great number on each part. Wherefore, against that day, my lord had required many worshipful gentlemen to be there present, to assist him with their wisdom to appease these two worthy gentlemen, being at deadly feud. And to see the king's peace kept, commanding no more of their number to enter into the castle with these two gentlemen than six persons of each of their menial servants, and all the rest to remain without in the town, or where they listed to repair. And my lord himself issuing out of the gates, calling the number of both parties before him, straightly charging them most earnestly to observe and keep the king's peace, in the king's name, upon their perils, without either bragging or quarrelling either with other; and caused them to have both beer and wine sent them into the town; and then returned again into the castle, being about nine of the clock. And because he would have these gentlemen to dine with him at his own table, thought it good, in avoiding of further inconvenience, to appease their rancour before. Whereupon he called them into his chapel; and there, with the assistance of the other gentlemen, he fell into communication with the matter, declaring unto them the dangers and mischiefs that through their wilfulness and folly were most likeliest to ensue; with divers other good exhortations. Notwithstanding, the parties laying and alleging many things for their defence, sometime adding each to other stout and despiteful words of defiance, the which my lord and the other gentlemen had much ado to qualify, their malice was so great. Howbeit, at length, with long continuance and wise arguments, and deep persuasions made by my lord, they were agreed and finally accorded about four of the clock at afternoon; and so made them friends. And, as it seemed they both rejoiced, and were right well contented therewith, to the great comfort of all the other worshipful gentlemen, causing them to shake hands, and to go arm in arm to dinner; and so went to dinner, though it was very late to dine, yet notwithstanding they dined together with the other gentlemen at my lord's table, where they drank lovingly each to other, with countenance of great amity. After dinner my lord caused them to discharge their routs and assembly that remained in the town, and to retain with them no more servants than they were accustomed most commonly to ride with. And that done, these gentlemen, fulfilling his commandment, tarried at Cawood, and lay there all night, whom my lord entertained in such sort that they accepted his noble heart in great worthiness and friendship, trusting to have of him a special jewel in their country: having him in great estimation and favour, as it appeared afterward by their behaviour and demeanour towards him."

[To be continued.]

The Structure of Plants, and the mode in which their Nourishment is obtained.—A perfect plant consists of three several parts: a root which throws out arms and fibres in every direction into the soil; a trunk which branches into the air on every side; and leaves which, from the ends of the branches and twigs, spread out a more or less extended surface into the surrounding air. Each of these parts has a peculiar structure and a special function assigned to it. The *stem* of any of our common trees consists of three parts—the pith in the centre, the wood surrounding the pith, and the bark which covers the whole. The pith consists of bundles of minute hollow tubes, laid horizontally one over the other; the wood and inner bark, of long tubes bound together in a vertical position, so as to be capable of carrying liquids up and down between the roots and the leaves. When a piece of wood is sawn across, the ends of these tubes may be distinctly seen. The branch is only a prolongation of the stem, and has a similar structure. The *root*, immediately on leaving the trunk or stem, has also a similar structure: but as the root tapers away, the pith gradually disappears; the bark also thins out, the wood softens, till the white tendrils, of which its extremities are composed, consist only of a colourless spongy mass, full of pores, but in which no distinction of parts can be perceived. In this spongy mass the vessels or tubes which descend through the stem and root lose themselves, and by them these spongy extremities are connected with the leaves. The *leaf* is an expansion of the twig. The fibres which are seen to branch out from the base over the inner surface of the leaf are prolongations of the vessels of the wood. The green exterior portion of the leaf is, in like manner, a continuation of the bark in a very thin and porous form. The green of the leaf, though full of pores, especially on the under part, yet also consists of or contains a collection of tubes or vessels, which stretch along its surface, and communicate with those of the bark. Most of these vessels in the living plant are full of sap, and this sap is in almost continual motion. In spring and autumn the motion is more rapid, and in winter it is sometimes scarcely perceptible; yet the sap is supposed to be rarely quite stationary in every part of the tree. From the spongy part of the root, the sap ascends through vessels of the *wood*, till it is diffused over the inner surface of the leaf by the fibres which the wood contains. Hence, by the vessels in the green of the leaf, it is returned to the bark, and through the vessels of the inner bark it descends to the root. Every one understands why the roots send out fibres in every direction through the soil; it is in search of water and *of liquid* food, which the spongy fibres suck in and send forward with the sap to the upper parts of the tree. It is to aid these roots in procuring food that, in the art of culture, such substances are mixed with the soil where these roots are, as are supposed to be necessary, or at least favourable, to the growth of the plant. It is not so obvious that the leaves spread out their broad surfaces into the air for the same purpose precisely as that for which the roots diffuse their fibres through the soil. The only difference is, that while the roots suck in chiefly *liquid*, the leaves imbibe almost solely *gaseous* food. *In the sunshine, the leaves are continually absorbing carbonic acid from the air and giving off oxygen gas.* That is to say, they are continually appropriating carbon from the air. *When night comes, this process ceases, and they begin to absorb oxygen and to give off carbonic acid.* But this latter process does not go on so rapidly as the former, so that, on the whole, plants when growing gain a large portion of carbon from the air. The actual quantity, however, varies with the season, with the climate, and with the kind of tree. The proportion of the whole carbon contained by a plant, which has been derived from the air, is greatly modified also by the quality of the soil in which it grows, and by the comparative abundance of liquid food which happens to be within reach of its roots. It has been ascertained, however, that in our climate, on an average, not less than from one-third to three-fourths of the entire quantity of carbon contained in the crops we reap from land of average fertility, is really obtained from the air.—*Johnston's Elements of Agricultural Chemistry.*

[Sandwich Islanders —Interview with Captain Cook.]

THE SANDWICH ISLANDS.

The Sandwich Islands, named in honour of the Earl of Sandwich, first lord of the Admiralty, were discovered by Cook in 1778, during his last voyage. Most of the islands of the Pacific lie in groups, and the Sandwich group consists of ten islands, eight of which are inhabited. Hawaii (Owhyee), the largest island, where Cook was killed, is of about the same extent as Middlesex and the counties of Kent, Surrey, and Sussex, joined together. Another of the islands is about the size of Hertfordshire; two others are not quite so large; and the remainder are considerably smaller. They are all probably of volcanic origin, and the surface is generally broken and mountainous. The interior of the islands is generally covered with forests, and the population is usually settled within three or four miles of the coast. The mean annual temperature is about 75°, the extremes being 61° and 88°. The climate is considered more agreeable than even that of Otaheite.

Cook estimated the population of all the islands at four hundred thousand, but this has always been considered too high, and Mr. Ellis, the missionary, does not think that they exceed one hundred and fifty thousand. A census taken in 1832 gave the total population of all the islands at 130,000, and another in 1836 at 108,000; but neither can be depended upon. For many years, however, the population had been decreasing; but, in consequence of improved habits and modes of life, the case is now reversed. The natives were described by Cook as "blest with a frank and cheerful disposition," and "equally free from the fickle levity which distinguishes the natives of Otaheite, and the sedate cast observable among those of Tongataboo." They are, however, of the same race which is found in the islands extending north and south over 70° of latitude, from the Sandwich group to New Zealand, and over 60° and 70° east and west, from Tongataboo to Easter Island. No traditions worthy of belief record the migration of this people over so large a space, but their manners and customs prove them to be of Asiatic origin. The Sandwich Islanders are generally well made, strong and active, their skins of a fine brown, inclining to a copper colour, hair black and rather coarse, and eyes constantly in motion. They do not appear ever to have been cannibals, and when Cook visited them in his "floating islands," and taught them "to know how great the world was," to use their own expressions, they were in a more advanced state than the natives of most of the Polynesian Islands. They cultivated their provision-grounds with care; manufactured a kind of cloth from the bark of the paper-mulberry; wove very neat mats with the fibres of the flax-plant; and exhibited considerable taste in their ornaments and dresses. A collection of their weapons and tools, and specimens of their cloths and mats, may be seen at the British Museum. But their moral state was in no respect superior to that of other benighted people. They acknowledged two beings as supreme authors of good and evil, each of whom had interme-

diate deities. The worship of their war-gods was the most conspicuous part of their superstition; and these deities were propitiated by the sacrifice of some of the prisoners taken in battle. Human sacrifices also occurred when other modes of propitiating the gods failed. The shark was an object of worship. Women were forbidden to eat certain kinds of food, or to enter the apartment in which the men took their meals; and yet they were not excluded from the rights of chieftainship.

The hog, dog, and rat were the only animals found on the islands at the period of their discovery, and were each used as food. The taro, pounded and formed into a paste; the sweet potato; several kinds of banians; the cocoa-nut and bread-fruit tree supplied them with vegetable diet. The sugar-cane furnished an agreeable nutriment. Fish, especially mullet, of very excellent flavour, were preserved for use in salt-water ponds. Since they were first visited by Europeans, the cow, horse, sheep, and goat have been added to their live stock, and all thrive well except sheep. The cattle which Vancouver left in 1792, were tabooed, or rendered sacred, for ten years, and became wild. Turkeys, geese, ducks, fowls, pigeons, are now bred; and the list of native fruits and vegetables has been increased by the addition of oranges, lemons, citrons, grapes, apples, pears, papaw apples, pomegranates, figs, melons, water-melons, cucumbers, pumpkins, French beans, onions, and red pepper. The pine-apple does not come to perfection, but tolerable wine has been made from grapes grown in the islands. Maize is the only kind of corn which is productive. The tobacco, coffee, and cotton plants have also been introduced, and at some future time their cultivation will form a valuable source of employment. The cultivation of the sugar-cane, with a view to the manufacture of sugar, has made some progress.

After the death of Cook the islands were seldom visited, and it was not until after Vancouver's voyage, in 1792, that the intercourse with them became more frequent. About this period also the Pacific Ocean began to be resorted to by ships engaged in the whale fishery, most of which touched at the islands for vegetables and fresh provisions. On the Spanish colonies in South America becoming independent, the Sandwich Islands rose into still greater importance as a maritime and commercial position. They were in the highway of ships trading between the west coast of America and the East Indies and China; and equally so for those which come from the Atlantic states of the American Union round Cape Horn, from which they sail direct to the Sandwich Islands, whence the trade-wind carries them quickly to Canton; and this constant intercourse has led them to imbibe the ideas and adopt the habits of civilized life with a rapidity which is without a parallel.

In November, 1819, Rhio-Rhio, having conferred with the principal chiefs, and found them favourable to his views, ordered the morais, or sacred places, and the idols, to be destroyed, and Christianity became the religion of the state. He broke through the custom which prohibited women eating certain kinds of food, or eating in the presence of men. At a great feast he sent to his wives those parts which it was unlawful to taste, and sat down with them in the presence of the people. An insurrection occasioned by these revolutions was repressed without difficulty. In 1820 missionaries arrived in the islands from the United States, and their number was subsequently increased by those from the London Missionary Society.* The natives became most anxious for instruction; schools were established; in 1822 the first book in the native language was printed; and the chiefs learned to read and write. To the civilizing effects of commercial intercourse were now added the still more powerful influences of Christianity.

When first discovered, each of the islands was governed by a petty sovereign or chief, who were often at war with each other. They were the proprietors of the soil, and partitioned it among inferior chiefs, who held their lands by the feudal tenure of military service and by the payment of an annual sum constituting a sort of ground-rent. Under these secondary chiefs were others of lower rank, who held their lands according to a similar tenure. The fourth class consisted of the bulk of the people. Tereipoo, who was sovereign of Hawaii when Cook was killed, was succeeded by a chief of great energy and ability, named Tamehameha, who has been called the Peter the Great of his country. He subjugated the various islands, and brought them all under his single sovereignty; and subsequently he took upon himself the office of chief priest as well as king. On Vancouver's visit in 1792, his rule only extended to Hawaii and Maui; but in 1817 all the others acknowledged his supremacy, and were under the authority of chiefs or governors of his appointment. He made a formal cession of Hawaii to England in the presence of Vancouver, but this proceeding was never acknowledged by any act of authority on our part. At a subsequent period, fearing that either the Americans or Russians would endeavour to establish themselves on one of the islands, he placed their independence under the protection of England. The Russians did erect a fort, but the act was disavowed at St. Petersburg. Tamehameha received from us a national flag, which has seven horizontal stripes, and the union-jack in the corner. He died in 1819, and was succeeded by his son, Rhio-Rhio. This young man, accompanied by his queen, and a suite of several persons, visited England, in order that the assurance of protection on the part of England against any foreign encroachment on the independence of the islands, might be renewed and strengthened, and generally to see all that was interesting in this country. Both the king and queen died in London of the measles, and the Blonde frigate, commanded by Lord Byron, conveyed their remains to their native country, in faithful obedience to their last wishes. All the expenses of their visit were defrayed by the government, and the survivors of the party received many valuable and useful presents.

In 1840 new laws came into operation relative to property in land, taxation, and other important subjects. Restrictions on the fisheries were removed, and a new plan of taxation adopted. These measures are calculated to encourage industry by more completely securing the rights of property and labour.

The welfare of the Sandwich Islanders now depends upon their progress in industry and the useful arts, and in general intelligence. Their political independence is guaranteed; they are masters of their native land; and cannot be exterminated or trampled upon as if

* The Appendix to the 'Report of the American Board of Missions for 1841' contains an account of the banishment of the Roman Catholic priests from the islands after they had exercised their functions for several years. In July, 1839, Captain Laplace arrived in a French frigate to demand satisfaction on the part of his government for the above act of expulsion, threatening to commence hostilities two days afterwards, unless the king consented to a treaty guaranteeing the freedom of the Roman Catholic worship to natives as well as foreigners; and he was also called upon to give a piece of land at Honolulu for the erection of a chapel, and to abolish the prohibition of the import of spirits. Captain Laplace demanded and received from the king a deposit of 25,000 dollars, to be retained until the treaty had been satisfactorily fulfilled. The king was compelled, under these circumstances, to execute the treaty. Previously, during the period when the Roman Catholic religion was exercised, the natives were prohibited attending the chapels.

they were defenceless barbarians. The fort of Honolulu is of considerable strength, and mounts sixty guns, and is garrisoned by about three hundred islanders dressed in regimentals, who mount guard and present arms in the same style as in Europe. The navy consisted a few years ago of a dozen brigs and schooners, and are of course chiefly valuable in a commercial point of view. The United States of America, also England and France, have each a consul at Honolulu, and each of these countries has entered into treaties with the government of the islands. At this port there are pilots and port charges as in European countries. For many years sandal-wood was one of the most valuable objects of commerce which the Sandwich Islands afforded. It was eagerly sought for by the Americans, who took it to China, where it was used as incense in the temples. As much as four hundred thousand dollars have been paid in a single year for this article, and this valuable source of revenue enabled Tamehameha and his successors to purchase ships and small craft, to pay the troops, defray the general expenses of government, and to obtain the conveniences of civilized life. The sandal-wood was not cultivated, and is now become scarce; and unless the falling off in this resource be accompanied by greater industry in the production of some other objects of demand, the expenses of the government will press heavily on the people. The plough has been lately introduced at some of the mission stations. The manufacture of cloth as a domestic manufacture has been introduced by the missionaries. They make tolerable seamen, according to Captain Beechey, and "are particularly useful in boats;" but when he visited the islands in 1826 the vessels belonging to the government were chartered chiefly to Americans, as the natives were scarcely competent to conduct them on a foreign voyage. At present the natives are in a transition state, the necessary effect of which is some incongruities belonging neither to a state of barbarism nor of civilization. The poorer classes are adopting the European costume after the example of those more wealthy. Many of the females of the latter class are dressed in the silks of China, wear green and red shoes, and some of them carry parasols, and have their handkerchiefs abundantly perfumed with lavender-water. The houses of the chiefs contain tables and chairs, and are built of wood; but some few are of stone. Boki, who visited England in the suit of Rhio-Rhio, displayed a service of expensively cut glass, and one of silver, at an entertainment given to the officers of the Blossom. Twelve or fourteen merchants, principally Americans, have established stores at Honolulu, where articles of European and American manufacture may be obtained, as well as the productions of China and other parts of the world. The articles most in demand are piece-goods, hardware, crockery, hats, shoes, naval stores, &c., which are retailed to the natives for Spanish dollars or sandal-wood. The town contains about seven thousand inhabitants, and there are billiard-rooms and public-houses for the accommodation of the ships' crews who visit the harbour. A newspaper is published in the English language, and several periodicals have been published at different times; one of which, in the Hawaiian language, sometimes contained articles written by natives. The printing-press is also employed in supplying the islanders with school and other books in the native language. Since the commencement of the American Mission a hundred million pages of printing have been executed. The translation and printing of the Bible in the native tongue was completed early in 1839. According to the 'Report of the American Board of Missions for 1841,' the number of foreign missionaries employed on the islands was seventy-nine, including physicians, secular superintendents, two or three printers and bookbinders, and forty female assistant-missionaries. There were nineteen churches, and above eighteen thousand church members. The number of schools was about two hundred, attended by fourteen thousand pupils, of whom ten thousand are stated to be readers. There were seminaries and boarding-schools for the children of chiefs, and for the education of native Christian teachers and ministers. The native Christians of the Sandwich Islands have contributed as much as 8000 dollars in a single year in support of the means of education and religious instruction.

ON THE PREPARATION OF DIES FOR COINS AND MEDALS.

A SLIGHT inspection of a newly-coined piece of money or an honorary medal must convince every one that the mould or original pattern whence it is produced must be a work of extreme nicety and importance. The outlines of the device are so fine, the legends and inscriptions so distinct, the head or other figure so gently and gracefully brought into relief, the surface of the sunken portions so smooth and regular, that it is evident the coin or medal owes its main beauty to the workmanship of the die-sinker or engraver. A few words in explanation of the process of manufacturing these dies may not be uninteresting.

It is perhaps scarcely necessary to remind the reader that coins are not *cast;* they are not produced by pouring melted metal into a mould, as ornamental works in iron and brass are generally made; they are *struck,* that is, produced by forcibly driving circular pieces of cold metal into the engraved mould or die, and causing them to assume the form and ornamental features of the mould. It is also observable that in all coins and medals the device is given in basso-relievo, or low-relief, that is, raised slightly above the groundwork or general level of the coin.

Although the metals whereof coins and medals are generally made are by no means hard, yet it is necessary to have an extremely hard die for striking them, both to ensure the production of many copies from one die, and to bring out all the fine lines which contribute so much to the beauty of the device. The dies are, therefore, made of steel; but as the steel is annealed to a certain state of softness for facilitating the labours of the engraver, and afterwards hardened for working in the press, the circle of labours includes many very complicated and difficult processes. The object, therefore, is to select a steel of a medium quality as to fineness of texture, not too easily acted on by dilute sulphuric acid, and exhibiting a uniform texture when its surface is washed over with a little aquafortis, by which its freedom from 'pins' of iron, and other irregularities of composition, is sufficiently indicated.

When a piece of steel, possessing the requisite combination of qualities, is selected, the process of formation commences. The steel is forged, at a high heat and with great care, into the rough die. It is then brought to a soft state by a delicate process of annealing, and in that state is turned and smoothed to a proper diameter and shape. This annealing is effected by heating the steel to that point known among workers in metal as the 'bright cherry-red,' and subsequently imbedding it in a crucible containing coarsely-pounded animal charcoal.

The steel being brought to a proper state, the engraver commences his operations. In the National Mint this office of course devolves on a highly skilled individual. At the present time Mr. Wyon fills the office of "chief engraver," and Mr. Pistrucci that of "medallist;" the former being engaged principally on the dies for the coinage, and the latter, as the title of his

office imports, on those for national and honorary medals. The manner in which these dies are engraved does not admit of being clearly described, and it may suffice, therefore, to say that the device is worked out in 'intaglio,' by means of small fine hardened steel tools. Every part which in the future coin is to appear raised is here depressed, such as the Queen's head, the Britannia, the letters, &c.; while those which are to appear depressed are here raised; the depressions in the die being equal in depth to the relief in the coin. In medals the device is generally bolder, or, as it is termed, in 'higher relief,' than in coins, and consequently has to be cut more deeply in the die. The engraver tests his progress by taking casts from the die, either in clay or by means of melted type-metal.

When the die is, after much tedious and delicate labour, brought to a finished intaglio state, it undergoes the process of hardening, as a preparative for the purposes to which it is afterwards to be applied. This process is of great importance, for any defect in the mode of conducting it may ruin the labour of many weeks or even months. The hardening resembles the previous process of softening, so far as regards the application of a high heat; but in the latter instance the metal is cooled gradually in the charcoal, whereas the former derives its peculiar character from the sudden cooling of the steel after being heated. If a bar of soft steel be made red-hot, and then suddenly cooled by immersion in cold water, it becomes hard, brittle, and fragile; but this alone would not suffice in the case of the die, the engraved face of which might be injured by such a process. This face is covered with a protecting paste of pounded charcoal mixed with oil, spread in a thin layer; and the die is then placed with its face downwards in a crucible, and completely surrounded by powdered charcoal. It is heated to a 'cherry-red,' and in that state is taken out with proper tongs, and plunged into a cistern containing a large quantity of cold water; here it is moved rapidly about, so long as a bubbling and hissing noise is heard, and is then left in the water till quite cool. Mr. Mushet (*Encyclop. Brit.*) describes a somewhat different mode of conducting this process.

The hardened die undergoes one or two processes to render it more durable. It is in some cases immersed in water, which is then gradually raised to the boiling point, and as gradually cooled. It is also sometimes thrust into a red-hot iron ring, of such diameter as just to fit the die when the latter is cold; consequently the ring, by contracting as it cools, binds the substance of the die with great force, and renders it less liable to crack in the subsequent operations. The die, when hardened and strengthened, is cleaned and polished, and then obtains the technical name of the 'matrix.' It is in a fit state to produce the devices on coins and medals; but lest any accident should happen to it, whereby the labour of the artist might be wholly lost, it is customary in practice to obtain several copies of this matrix, so that when one is injured, or worn out, others may be ready to replace it. A block of steel is selected, carefully annealed, turned to the proper shape, and well polished. By the aid of powerful machinery it is pressed forcibly upon the matrix, and by virtue of its softness gradually conforms to the form of the latter. This however is not done at once, for the punch becomes hardened in the act of pressing, and requires to be repeatedly annealed or softened, otherwise it would either split into fissures or else injure the matrix. These processes succeed each other in a long series of alternations, viz., softening the steel by annealing, and then forcing it to assume the device of the matrix by powerful pressure.

From this punch may be produced any number of dies, each of which will resemble the original matrix. Pieces of soft steel, being impressed by this punch, and afterwards turned, polished, &c., become practically as useful as the original matrix, and are then used in the coining-press to produce the coins. In the Mint, the internal economy of which is arranged on the strictest principles (every official having his duties prescribed for him with the utmost exactitude), the two officers most closely connected with the preparation of the dies are the 'clerk of the irons' and the 'chief engraver;' and their duties are thus apportioned. The 'clerk of the irons' is to superintend the die-press rooms: the purchasing and forging of the steel; the engraving, hardening, and turning of the dies; to keep a true account of all the blank dies, matrices, and punches belonging to the Mint; to receive from the master and comptroller, and to transmit to the engraver, all orders respecting the dies; to unlock and be present whenever the great die-press for multiplying the dies is used; to be responsible for the die-press not being used for improper purposes; and to see that no medal or coin be struck, but by a written order from the master or his deputy. The 'chief engraver' is to make or receive draughts and models for dies, as the master may direct; to engrave the dies from the designs and models; to oversee the production of punches and dies in the press-room; to receive from the clerk of the irons the dies for any particular coinage, and to see that they are in a fit working state; to make a monthly return of all faulty or worn-out dies to the clerk of the irons; and to see that, during the actual process of coinage, the dies are renewed from time to time, as soon as the impressions appear in the least defective.

"The number of pieces which may be struck by a single die of good steel properly hardened and duly tempered not unfrequently amounts at the Mint to between three and four hundred thousand, but the average consumption of dies is of course much greater, owing to the different qualities of steel, and to the casualties to which the dies are liable: thus, the upper and lower die are often violently struck together, owing to a fault in the 'layer-on,' or that part of the machinery which ought to put the blank into its place, but which now and then fails so to do. . . . . There are eight presses at the Mint, frequently at work for ten hours each day; and I consider that the destruction of eight pair of dies per day (one pair for each press) is a fair average result, though we much more frequently fall short of, than exceed, this proportion. It must be remembered that each press produces three thousand six hundred pieces per pair; but, making allowance for occasional stoppages, we may reckon the daily produce of each press at thirty thousand pieces: the eight presses therefore will furnish a diurnal average of two hundred and forty thousand pieces." *

In the less frequent event of 'medals' being struck, the operations of the press are much more difficult and slow than in producing coins, owing to the generally high relief which medals present. It is stated by Mr. Brande, that in a medal executed by Mr. Wyon, for the Royal Naval College, there was a representation of the head of the king, in such bold relief, as to require thirty blows of a very powerful press to complete the impression; and that it was necessary, on account of the hardening produced by the pressure, to anneal each medal after every third blow, so that they were placed in the furnace ten times during the process of stamping. About five years ago, there was a notice of a new method invented by Mr. Pistrucci, whereby medals could be produced without the process of engraving the dies; but we are not aware how far it has been practically applied.

* Professor Brande, in the 'Journal of Science.'